



“Resource efficiency is a growth market.”

An interview with Dr. Bertram Lohmüller, director of the Steinbeis Innovation Center for Sustainable Resources and Energy Management

Dr. Bertram Lohmüller talks to TRANSFER about the sustainable and efficient use of resources and considers the role that social factors play. He also takes a look at future developments in this field.

Dr. Lohmüller, you're a civil engineer with an MBA in marketing. How did you end up becoming so closely involved in the sustainable use of resources?

Sustainable construction and energy efficiency are a core part of a civil engineering degree, and structural engineering also takes sustainability into consideration. Because I'm an engineer, I'm interested in all kinds of technology issues. If I think back to my first job at Bilfinger in Mannheim, I spent a lot of time looking at environmental issues and innovative ways to sustainably seal landfills and clean up sewer systems. During my time as a community councilor in Tübingen, I was closely involved in issues relating to the different ways to sustainably carry out urban development and source energy. I was a member of the environmental committee and the supervisory board of the municipal utilities company in Tübingen. The sustainable use of resources are still an important field of business and research today, on both a national and an international level. But to use new technologies and implement energy models properly in the field of energy and resource application, you need market acceptance and demand. So for me, the fields of technology and business development are closely intertwined. At our Steinbeis Innovation Center, competence relating to energy exploitation and resource application go hand in hand and they form part of the master's degree in Global Technology Management at the Steinbeis Transfer Institute called Steinbeis Global Institute Tübingen. There are further overlaps in our collaboration with Export-Akademie Baden-Württemberg.

What do you believe is the best way to achieve sustainable and efficient resource utilization and what role do social factors have to play?

Sustainable resource use is reflected in the moral values and behavior of (manufacturing) companies and consumers. Also, people are continuously coming up with new and improved technologies and exploitation options. One particularly important driver of this is digitalization (like the Internet of Things) because it makes it possible to offer physical objects for common use – things like cars, bikes and even places in a “sharing economy.” On a global level, it's important to look at technologies and implementation strategies, and the way resources are used sustainably and efficiently in Europe, and transfer this to other countries. Particularly developing nations face the challenge of implementing new methods for dealing with the rising pollution levels, despite the fact that resources are simultaneously becoming more scarce. I strongly believe that the only way to lay a sensible foundation for life for future generations is to attain a “new global awareness” in terms of the way we deal with our natural resources. So to implement resource-efficient models worldwide, it will be necessary to train the so-called experts and multipliers. This is why we're working in close collaboration with partners in Argentina, Brazil, the rest of Europe, India, and Iran, to put a master's degree in Global Technology Management in place. This degree pulls together the topics of sustainable resource use, renewable energy, and the Internet of Things, which are all important fields of technology and research.

One of the topics your Steinbeis Enterprise focuses on is bioeconomics. What sort of issues do your customers ask you about in this respect?

A good example is a research project backed by the Federal Ministry of Education and Research, which looks at “Polycultures involving the European crayfish (*astacus astacus*) and blue whitefish (*coregonus wart-*

manni)." The starting point for this project is the growing importance of fish farming in order to safeguard the worldwide supply of protein. Transferred to the European context, the challenge is to produce premium quality organic produce using local production methods in a high-price market segment. One way to meet this challenge is to farm edible freshwater crustaceans threatened by extinction and to use new types of mixed farming (polyculture) with local edible fish that is in strong local demand. The farming methods require new feeds and technologies (such as closed mariculture systems and pond systems), which have to be developed and tested. An exact-fit business model is also being developed with key players in the market. Another challenge is to set up regional networks with all key players involved in the organic product market. We're currently working on first ideas for setting up a website platform to optimize the value chain for the sustainable production of organic products. The aim of the platform is to make the value chain fair and transparent – with traceability – and to promote a mutual understanding in the (nutrition) industry, from the original producers to the end user. Another project involves the development of new kinds of plate membranes for use in the ultrafiltration of water. The idea is to use a new kind of technological procedure and optimize the membranes to improve the energy efficiency of ultrafiltration plants – and thus make it possible to operate drinking water treatment plants and process industrial wastewater more economically.

Renewable materials are a key topic when it comes to the sustainable use of resources. What impact do they have on the environment – in a positive and negative sense?

We're currently conducting research into renewable raw materials as part of two international innovation clusters in collaboration with universities, research institutions, public bodies, and businesses. The key issue we're looking at is the sustainable use of biomass along the Danube river, with an emphasis not just on how to use resources already available in our environment, but also the farming of fast-growing timber in plantations to be used as biomass. To lay a foundation for the project, we're doing a local stocktaking exercise to develop regional utilization models for renewable raw materials. It's really important to take the local situation into consideration in order to avoid the risk of over-farming and any threats this would pose to the local ecosystem. Making good use of unused biomass or cultivating fast-growing plants in plantation farming helps compensate for energy bottlenecks. A number of new methods are being looked at as part of this research project. But it's important that planting is adapted to regional conditions to make sure that nutrition is used optimally and that the Danube itself isn't polluted with irregular nutritional elements. Another goal with the project is to develop new, highly mechanized techniques for harvesting biomass products, as well as technologies for processing energy resources and validating their economic viability. But it would be short-sighted to use renewable timber and grass as biomass for combustion or gasification. It's more about building up and managing material cycles to use biomass intelligently. This means creating value chains for processing high-value timber into products, setting up collection systems for waste wood, and processing materials together with other raw materials to generate energy.

Using resources sustainably will be an important issue for a long time to come. Where do you think the priorities will lie in the immediate future, which issues or problems?

Resource efficiency is a growth market. Population growth, rising affluence and the trend toward urbanization are all fuelling growing demand for resources and shortages in the reserves of raw materials. I see this pressure to develop environmentally efficient and resource-efficient technologies, especially in the fields of energy, water, food production, and new materials. The challenges are varied, so the complexity this leads to means that new models are needed to closely dovetail technical, economic, and social innovations. In the western economies, these challenges are being met with technological developments, or new models like the sharing economy, citizen involvement, and connected (or smart) cities. From a global standpoint, the biggest challenge is actually to support emerging countries in managing their problems. Western technologies have to be adapted to the regional needs in developing countries through "frugal innovation," sometimes called low-cost innovation. New products and services for using resources sustainably make it possible to create new jobs and improve living standards. For us as a Steinbeis Innovation Center, this is a fillip to keep expanding our global network and to keep working together with our partners to develop new technology transfer models – in terms of the technology, the economics, and the social aspects – and to implement those models.

Image: Rotor blades on a wind power turbine. © Export-Akademie Baden-Württemberg



Dr. Bertram Lohmüller is co-director alongside Norbert Wagemann of the Steinbeis Innovation Center for Sustainable Resources and Energy Management. The services offered by the Steinbeis Enterprise range from setting up national and international innovation hubs to the implementation of research projects and providing advice on collaborative research.



Dr. Bertram Lohmüller
Steinbeis Innovation Center
Sustainable Resource and Energy Management (Tübingen)
SU1935@stwt.de | www.steinbeis.de/su/1935